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ABSTRACT

This paper describes a number of different types of training aids currently employed in online training: non-interactive audiovisual presentations; interactive computer-based aids; partially interactive aids based on recorded searches; print-based materials; and kits. The advantages and disadvantages of each type of aid are noted, and a table showing when in a training program and for what purpose each of the particular types could be used is provided. The appendix lists some currently available training aids of each type. (Author/THC)

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TRAINING AIDS FOR ONLINE INSTRUCTION AN ANALYSIS

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Keywords: *Training aids, Teaching Aids, Online Instruction, Computer-assisted Instruction, Audio-visual Aids.*
Abstract: There are a number of different types of training aid currently employed in online training: non-interactive audio-visual presentations; interactive computer-based aids; partially interactive aids based on recorded searches; print-based materials; kits. Each of these types is described and the advantages and disadvantages noted. A table showing when in a training programme and for what purpose each of the particular types could be used is provided. The Appendix lists some currently available training aids.

1 INTRODUCTION

To the neutral bystander it might seem rather surprising that a wide range of training aids has been developed to help in instruction in how to use online search systems. In teaching an essentially practical activity it is reasonable to ask why instruction cannot be based more or less entirely around the system itself. After all when teaching topics such as programming the preliminary talking is rapidly followed by a retreat to the terminal for the essential "hands-on" experience.

There are quite a number of reasons why the various organisations involved in online training - systems operators, database producers, library and information schools, professional bodies etc. - have developed and use training aids. These include:-

a) high costs involved (telecommunications, database royalities etc.) in basing training on the actual systems.

b) technical problems (line down, system unavailability etc.) which can prevent use of the real systems.

c) unsympathetic nature of the actual systems to the learner.

d) nature of the learners - unfamiliar with computer equipment.

e) need to present information (including wider perspectives) in an interesting and varied way.

Not all of these reasons apply to all training aids nor, of course, are they applicable to all agencies offering online instruction. Library schools, for example, will be considerably affected by the high costs in using online systems whereas this factor will be largely immaterial to systems operators.

2 TRAINING AIDS

Training aids can be categorised as follows:-

a) Non-interactive mainly audio-visual presentations.

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b) Interactive computer-based aids.
c) Partially-interactive systems.
d) Print-based materials.
e) Kits incorporating two or more of above types.

(a) Non-interactive mainly audio-visual presentations

These aids can be subdivided:-

(i) Films, videocassettes, tape/slide presentations.

(ii) Recorded searches including Mediatron tapes, Hewlett Packard 2345 tapes, Texas Instruments Silent 700 cassettes.

Details of some commercially available aids in category (i) are provided in the appendix (Nos. 1-7). The advantages of these types of aids include:-

1. Can be shown to large groups.
2. Often of high 'professional' quality.
3. Can provide 'behind-the-scenes' views, e.g. of computer centre.
4. Can be used over and over again.
5. Equipment is widely available.

The disadvantages of these aids includs:-

1. Can 'date' very quickly.
2. Can have unacceptable biases.
3. Can be relatively expensive to buy.
4. Content may not meet all the requirements of the training organisation.

It is, of course, perfectly possible to produce films, videotapes or tape/slides in-house. In this case it will be possible to ensure that all the requirements of the particular organization are met and that the bias is appropriate. Tenopir and Bird discuss the advantages of making in-house videotapes mentioning in particular the ability to record directly from a visual display unit onto tape, the portability and the increasing familiarity of the medium (Ref. 1). It is worth noting, though, their comments on creating the tapes.

"Scriptwriting, revising, storyboarding and auditioning cast members was a large task, but it paled compared to the time required for taping, retaping and editing".

Tape/slide presentations are likely to take even longer to produce. Knapp tells a story of spending hours producing a tape/slide programme to describe the use, at the State University of New York at Albany, of the Suny Biomedical Communication Network (Ref. 2). Shortly after completion of the programme Suny BCN went out of existence!

Recorded searches

It is often felt that it is important when introducing online services, particularly to those with little or no knowledge about the phenomenon, to show an actual 'live' search at an early stage. Fjallbrant reported that out of 13 Swedish academic libraries which provided instruction in computerized information retrieval 12 carried out a 'live' demonstration (Ref. 3). It is argued that a 'live' demonstration helps the audience appreciate the interactive nature of the systems. The audience can see the immediate affect of particular instructions and their interest can be enhanced by carrying out searches on their suggested topics. The 'live' demonstration, however, is totally dependent upon the operation of the system at the time of the demonstration. System failures may be rare events but if they occur during a 'live' demonstration they can be disastrous unless there is some method of back-up.

Mediatron

This is an instrument based on a stereo cassette recorder, which can

record:-

a) digital signals to control display on a visual display unit.
b) voice commentary.
c) pulses to trigger slides.

It is therefore possible to record a search and play it back at the actual speed of input and response before an audience with or without commentary and slides. The use of Mediatron at the University of London and Chalmers University of Technology in Sweden has been well described (Ref. 4).

Other Recorded Search Systems

Terminals such as the Hewlett-Packard 2345A and the Texas Instruments 734ASR can be used to record searches. The tapes can be edited and stop codes inserted where appropriate, although it is of course possible in both cases to manually stop the tape during playback. Whether one is relying entirely on recorded searches or using them as a backup it is essential that sufficient monitors are made available. It is an extremely off-putting experience to have to attempt to view a distant screen but it is a situation, which even after some years of experience in online training, is still found. In the case of the TI 734ASR it is necessary to play back through a visual display unit for demonstration to large groups. The use of recorded searches with both of these machines has been described (Ref. 5).

The production of recorded searches is something which it is likely to have to be done in-house. The University of London Central Information Service has prepared a number of tapes which can be purchased but this is not normally the case (Ref. 6). Organizations are, however, likely to want to prepare tapes to meet their own requirements and the particular interests of the audience. The preparation of Mediatron tapes complete with commentary and pulsing is a time-consuming task but recorded searches can be made quite quickly especially if stop codes do not have to be inserted.

(b) Interactive computer-based aids

Considerable time and effort has been expended in the development of computer-aided instruction (CAI) in the online area. As Moghdam put it as long ago as 1975, "It (CAI) serves a double purpose in that it conveys instructional messages while preparing the user for the type of interaction which he must get accustomed to in working with an on-line system" (Ref. 7). There is no doubt that educational objectives have led to the development of CAI in this area but the need to minimise telecommunications and other costs in using the systems themselves has been an equally significant factor. Once the not inconsiderable development costs have been met there need be few other costs no matter how often the programs are used. Programs can be run either on a parent institution mainframe or mini-computer at no cost to the training body or run on the training bodies' own micro-computer. If the programs can be obtained from another organization development costs can be eliminated.

There are three basic types of computer program currently employed:-

1. Question/answer programs.
2. Simulations.
3. Emulations.

(i) Question/answer programs

These are structurally no different to similar programs used in education generally and typically involve the selection of the correct answer from a number of possibilities. The programs which have been developed concentrate on testing the user's knowledge of command languages.

The use of these types of system have been described in a number of papers (Ref. 8).

Well-devised question/answer programs can help to reinforce knowledge about the use of very specific aspects of online systems and can of course provide further instruction if the user is unable to answer the question say, after three attempts. At the same time the user gains some experience in using a keyboard (although it is likely that any actual searching will be carried out on a terminal not a microcomputer). It is important, however, not to over-emphasize this approach because it gives a rather limited perspective of the use of online systems. Additionally, particularly if computer memory is limited, it can be difficult to create a program which provides the most appropriate responses to user errors. It is not really sufficient, especially with completely inexperienced and often fearful users, for the program to simply state that a particular response is wrong and that the correct response is something else. A human teacher would explain why a particular answer is wrong and it is not unreasonable to expect CAI programs to do likewise.

(2) Simulations

These types of aids are often called simulations with the implication that they are representations of the real system. They are, however, only representations of the real systems within the parameters of a particular search. The term linear search perhaps conveys rather better what the aids comprise but for reasons of conformity the term simulations will be used in this paper.

They attempt to show the user the totality of a search, providing guidance on what is happening at each stage and allowing input where appropriate. In a sense they extend the concept of recorded searches (the core of the program is normally a previously carried-out search with the appropriate postings etc.) by incorporating instructions and subroutines which will compare user input with the stored 'correct' input. They are a stage further on than question/answer programs in that not only do they provide keyboard experience and instruction in the use of the command language but they show the use of the commands in the context of a search.

The major weakness of them, though, is that the user follows a defined search path. He is not free to heuristically develop a search strategy.

Teaching aids such as described above have been quite enthusiastically adopted in United Kingdom Library Schools and details of a number of available ones are listed in the appendix (Nos. 9-16).

(3) Emulations

Such emulations as exist are in most respects small scale versions of real systems but differing in the respects that the database of records is much smaller and that user guidance, not available in the actual systems themselves, is included. They therefore incorporate the advantages but avoid the disadvantages of the other computer-based systems discussed above. Within the limitations of the database(s) used, searching can be freely carried out by the user so search strategy can be learned as well as the other aspects. The major weakness of these systems lies in the size of the database and the consequently limited number of postings. Details of two emulations are listed in the Appendix (Nos. 17-18).

It has been convenient to categorise computer-based teaching aids but in fact many actual systems comprise elements from two or more categories. TRAINER, which was the forerunner of computer-based aids, comprises modules which introduce commands and searching techniques as well as DIALOG and ORBIT emulators. The SEQUOL simulation includes modules instructing the

use of ESA-IRS commands and MEOBS includes question/answer programs as well as a DIALOG emulator.

The cost and time involved in devising and writing the programs for computer-based aids can be quite considerable. The Sheffield University simulations were developed mainly by students undertaking higher degrees which enabled costs to be kept low while the MEOBS project was funded by a British Library Research Grant. MEOBS was developed over a period of 16 months although a certain amount of 'down-time' due to disk malfunctioning is included in this.

(c) Partially-interactive systems

The recorded searches discussed above can be modified to allow a degree of interaction by the user. The previously recorded search can be edited by adding stop codes and, if necessary, guidance. On playback the tape will stop automatically at those points where the user is required to enter a command. The command can be entered and the tape (or cassette) restarted. The recorded command will then be printed over the user's input. Instead of recording guidance on the tape an audio-cassette can be made to be played back during the search. The major drawback of these systems is that the user's interaction is limited because mistakes will not be recognised and it will not matter at all which command, if any, is typed in. The user is therefore not encouraged to concentrate since the tape can be progressed regardless of input. On the other hand the user will be using the terminal which will be used for the 'live' search and the time involved in producing this type of aid is much less than that for computer-based aids.

(d) Print-based materials

The concept of the workbook is one that has found popularity in North America but not the United Kingdom. A major reason affecting the attitude in the United Kingdom was that workbooks, such as Bourne's, (No. 22) were designed to be used in conjunction with quite a large amount of 'live' searching which was, of course, very expensive. The differential between searching costs in the United Kingdom and United States was greater in the 1970s than it is today and at that time UK library schools with the help of the British Library Research and Development Department concentrated their resources on developing training aids which avoided online costs.

Once established this pattern has largely prevailed although recently BLAISE has produced two workbooks to be used with the MARC training file - UKCTRAIN, and MEDLINE (Nos. 20, 21). Both workbooks comprise paper and terminal exercises and answers are supplied.

If it becomes the trend for hosts to prepare this kind of material those involved with training will have much to gain. Even if it is felt inappropriate to use the whole workbook it should be possible to extract those parts felt to be most relevant. The provision of tried and tested searches, for example, in a range of subjects, databases and systems would be a particularly invaluable service for trainers and educators.

(e) Kits

General educational circles have seen the teaching kit, comprising booklets, records, tapes etc. for quite some time and recently various online bodies have produced similar multimedia materials. The BIOSIS TRAINING COURSE (No. 23) comprises slides, script and workbook and can be used either with groups or with individuals. INFOTAPE (No. 24) comprises an audio-tape and booklet and is designed to be used 'live' with Pergamon-Infoline. The quality of packages such as these is high, both from the point of view of presentation and of content, and it is to be hoped that more database producers and hosts recognise how useful these aids can be.

3 USE IN A TEACHING PROGRAMME

The range of teaching aids available means that it is possible to provide a programme of instruction which is sufficiently practical yet avoids excessive online costs, caters for the different learning capacities of users, and is interesting and varied in approach. The choice of which particular aids to use will depend on what is available to the training organization, the time available and the needs and requirements of the particular audience. In particular, while many of the aids can be used with intermediaries and end-users alike a number have been specially designed for use with intermediaries. A suggested programme would be:-

TOPIC	TRAINING AID	PURPOSE
1. Introduction	Film, tape/slide, videotape	To provide an overview
	Recorded search (alone or as a back-up)	To show general structure of a search
2. System Commands	Recorded search	To show system responses to particular commands
3. Practical work	Recorded search (limited interaction)	To provide a 'gentle' introduction to keyboard and searching
	Question/answer program	To test knowledge of commands
	Simulation	To demonstrate the structure of a search and allow user interaction
	Emulation	To allow user to freely develop search strategies

PRACTICAL WORK

(alternative strategies)

The diagram indicates that there is more than one way of using teaching aids for practical work. If a choice is available the most suitable pathway is probably B from simulation to emulation including, if necessary, question/answer programs. The reason for suggesting that question/answer programs are a variable is that some linear search systems instruct the user exactly what to type in while others leave some room for thought. If the particular linear search system is the former it is desirable to have something to find out the user's appreciation of commands.

4 FINDING OUT ABOUT TRAINING AIDS

Considerable effort, especially by the library schools, has been spent developing teaching aids but little effort has been spent providing bibliographical control of them. Various authors have provided reviews of available material (Ref. 9). and the appendix to this paper lists a range of currently available material. It has recently been recommended that a European database of training aids be developed and certainly there is room for co-operation at this level. The retrospective coverage of teaching aids is, though, reasonably satisfactory but keeping up-to-date with newly developed aids is, not surprisingly, more difficult. As a service to its members the sub-committee on education and training of the United Kingdom Online Users Group (UKOLUG) collects information on training aids and publishes details from time to time in the UKOLUG Newsletter.

If it is difficult to find out about the existence of training aids it is even more difficult, at least with the computer-based aids, to see them in operation before deciding to buy. It is true that aids are often demonstrated at conferences and seminars (some UK library schools demonstrated aids at the 6th International Online Information meeting) but not all users are in a position to attend such gatherings. The idea of having a permanent exhibition of training aids perhaps associated with such an organisation as the Aslib Online Information Centre is quite an appealing one.

5 CONCLUSIONS

It was said earlier that costs played a major part in deflecting online teaching from the actual systems towards computer-based aids. It might, though, be a salutary lesson to compare equipment, development and running costs for these aids as opposed to incurring usage charges for training on the real systems. It was also said that the rather unhelpful nature of the actual systems, particularly to the very inexperienced user was another important factor in diverting training from the systems themselves. It is certainly difficult to argue that the systems were originally designed with the needs of the likely users to the foremost. Systems operators do provide help to users (training files, help commands etc.) but there is still quite a gap between what CAI programs can do and what is possible on systems at the moment. Moghdam's proposal that "if the CAI were enmeshed with the retrieval system, the ideal learning environment could be attained" is one worth striving for and one which is certainly capable of being attained (Ref. 10).

6 REFERENCES

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2) Sara D. Knapp. Instructing library patrons about online reference services. The Bookmark 38(5) 1979 p.237.

3) Nancy Fjällbrant. Online education round the world: education and training of end-users in Swedish academic libraries. IATUL Proceedings 14 1982 p.55.

4) Nancy Fjällbrant and Sture Hård. Design and evaluation of multimedia programmes for education in on-line information retrieval. Tidskrift fuer Dokumentation 35(5) 1979 pp.101-106.

A. Vickery and A.M. Batten. Development of multimedia teaching packages for user education in online retrieval systems. Online Review 2(4) 1978 pp.367-373.

5) R.F. Guy and J.A. Large. Online bibliographic searching in the library school curriculum. Library Review 30 1981 pp.27-33.

J. Brian Livesey. Teaching on-line information retrieval and automated circulation control. Part 1: On-line information retrieval. London: British Library, 1980. BLR&DD report no. 5592.

Bernard Houghton and Maria Fortune. Teaching on-line information retrieval using intelligent terminals. London: British Library, 1980. BLR&DD report no. 5567.

6) Vickery and Batten. op.cit. pp.372-373.

7) Dineh Moghdam. User training for on-line information retrieval systems. Journal of the American Society for Information Science 26(3) 1975 p.186.

8) R.F. Guy, J.A. Large and C.J. Armstrong. Microcomputers simulations of online bibliographic systems for teaching purposes. In Proceedings of the Second National Online Meeting, New York, March 24-26 1981. Medford: Learned Information, 1981, pp.261-270.

J.A. Large and C.J. Armstrong. The microcomputer as a training and for online searching. Online Review 7(1) 1983 pp.53-55.

9) E. Caruso. Computer aids to learning online retrieval. In Annual Review of Information Science and Technology 16(1981) pp.317-335.

S. Keenan and A. Vickery. Training requirements for online intermediaries. London: British Library, 1982. BLR&DD report no. 5724. 1 microfiche.

I. Malley. A catalogue of AV media and CAI software for user education in librarianship. Loughborough: INFUSE Publications, 1982. 1 microfiche.

L.A. Tedd. Teaching aids developed and used for education and training for online searching. Online Review 5(3) 1981 pp.205-216.

10) Moghdam. op.cit. p.186.

APPENDIX

Online Training Aids

A. NON-INTERACTIVE MAINLY AUDIO-VISUAL PRESENTATIONS

Films and videotapes

1. ACCESS/by John Nutt. Los Angeles, CA: Department of Communication, Stanford University, 1975. 1 film reel (20 min.); sd., col., 16mm.
Illustrates the widespread significance of online by showing a number of contrasting systems including one for Congress and another for community information.

2. Computerised information retrieval. Hatfield: Hatfield Polytechnic, Library, 1980. Videocassette 15 min.; sd., col. VHS.
Demonstrates use of online searching on DIALOG using topic "video games".

3. The DIALOG information retrieval service - worldwide information at your command/[produced by DIALOG Information Retrieval Service]. Palo Alto CA: DIALOG marketing department, 1981. Videocassette 15 min., sd., col. VHS; SONY.
A description of the DIALOG system. Shows search on ABI/INFORM and other features - DIALORDER, DIALINDEX.

4. The invisible ingredient. London: Melrose Productions, 1982. Videocassette 24 min., sd., col. Any format. Available from: Euronet-Diane, BP777, Luxembourg.
Intended as a general introduction to online searching. A search is carried out on FSTA database on ESA-IRS.

Tape/slide presentations

5. Online searching/[by] L.A. Tedd. Cardiff: Drake Educational Publishers, 1979. 77 slides (col.), 1 sound cassette (12 min.) and 1 script.
A general introduction to the topic. Progresses from the receipt of an inquiry through the use of an online system (SDC) to receipt of offline prints. The advantages and disadvantages of online searching are discussed.

6. Public libraries: a new information era/Edinburgh City Libraries and Loughborough University. Loughborough: Audio Visual Services, Loughborough University, 1981. 69 slides (col.), 1 sound cassette (20 min.) and 1 booklet.
Discusses equipment required on how to do a search and consideration of effects on library services. Videotex in libraries also discussed.

7. Graffiti on a database: a lighthearted look at database searching/by T. LaBorie. Medford, N.J.: Learned Information, 1980. 62 slides (col.) 1 sound cassette (9 mins.) and 1 booklet.
Shows how online searching systems operate using search topic "graffiti artists".

Recorded searches

8. A. Vickery and A.M. Batten. Development of multimedia teaching packages for user education in online retrieval systems. Online Review, 2(1978) 367-373.
Appendix lists 12 Mediatron cassettes available from Central Information Service of the University of London.

B. INTERACTIVE COMPUTER-BASED TEACHING AIDS

(i) Simulations

9. E. Caruso. TRAINER. Online 3(1981) 36-38.
Brief description of computer-based system to aid individuals learn and practice online skills. There are 9 modules. 1-7 are tutorial, 8 is DIALOG and 9 ORBIT. Now available via TELENET.

10. FOSSILS 2. Sheffield: University rev. ed. 1980. Computer simulation (60 mins.). 1 Basic program. £15 + VAT.
Simulates searches on DIALOG. Available from F. Wood, Department of Information Studies, University of Sheffield, Sheffield, S10 2TN.

11. MUTE 2. Sheffield: University, 1980. Computer simulation (60 mins.). 1 Basic program (modular). £20 + VAT.
Teaches use of BLAISE-MEDLINE. Available from F. Wood, Department of Information Studies, University of Sheffield, Sheffield, S10 2TN.

12. SEQUOL. Sheffield: University, 1982. Computer simulation (60 mins.). 1 Basic program (Apple II). £30 + VAT.
Teaches use of ESA-IRS by means of searches of increasing difficulty. Available from F. Wood, Department of Information Studies, University of Sheffield, Sheffield, S10 2TN.

13. SSDC. Sheffield: University, 1981. Computer simulation (60 mins.). 1 Basic program (modular). £20 + VAT.
Teaches use of SDC system. Written for PRIME 400 but transferable to other machines. Available from F. Wood, Department of Information Studies, University of Sheffield, Sheffield, S10 2TN.

14. A. Vickery, A.M. Batten and J. King. Microblaise, Medline and the Elhill command language: an interactive simulation program of Medline and the Elhill command language. London: Central Information Service, University of London, 1981. 1 program tape. CIS Software Series No.3.

15. A. Vickery. DIALOG with PET: an interactive simulation program of the DIALOG command language. London: Central Information Service, University of London, 1980. 1 program tape. CIS Software Series No.1.

16. F.E. Wood. Online teaching aids from the Department of Information Studies, University of Sheffield, England. Online Review 5(1981), 487-494.
Describes FOSSILS, MUTE and SSDC.

(ii) Database Systems - Emulations

17. A Microcomputer teaching package for online bibliographic searching/ by J.A. Large and C.J. Armstrong. London: British Library, 1983. Part 1: Manual BLR&D Report No.5740; Part 2: Workbook BLR&D Report No. 5741 + 3 x 8" floppy disks. £60.00.
The computer aspect has 2 parts. Part A comprises 9 questionnaires which test knowledge of DIALOG commands and other features. Part B is a micro-database containing c100 records which can be searched using most of DIALOG's commands.

18. D.K. Johnson. Report on the conversion of an online information retrieval system simulator for use on an ITT 2020 APPLE microcomputer. London: British Library, 1980. BLR&D Report No.5580.
Describes programs which can be used to create a small database with inverted files. Searching carried out using ESA-IRS commands. Details of programs available from S. Keenan, Department of Library and Information Studies, Loughborough University, Loughborough, Leicestershire, LE11 3TU.

C. PRINT-BASED MATERIALS

19. M. Henry and M. Young. Prompt cards for online search languages. London. Macmillan, 1980. 8 cards (16 sides).
Command languages for DIALOG, SDC, BLAISE, BRS, ESA, Pergamon, Deco.

20. Peter W. Dale. UKCTRAIN: a workbook for users of the BLAISE-LINE system. London: BLAISE, [1983]. 144pp.
Provides guided instruction in use of the BLAISE-LINE files and practice in use of the training file - UKCTRAIN. Includes 13 paper exercises and 14 terminal exercises; answers are supplied.

21. Peter W. Dale. MEDTRAIN: a workbook for searching MEDLINE on BLAISE services. London: BLAISE, [1983]. 104pp.

22. C.P. Bourne. DIALOG Lab workbook: training exercises for the DIALOG Information Retrieval Service. 2nd ed., Palo Alto, California: DIALOG, 1979.

D. KITS

23. BIOSIS Training course/produced by User Services Department. BIOSIS. Philadelphia: Biosciences Information Service, 1980. 39 slides (col.) and script and workbook.
Designed to be used as a self-teaching aid for beginners and as a teaching tool by experienced searchers. Suggested training sequence is slides and script, followed by use of the workbook.

24. INFOTAPE 1: a self-teaching tape programme for online searching with Pergamon Infoline/produced by University of London Central Information Service. London: Pergamon Infoline, 1983. 1 sound cassette (60 min.) and 1 booklet.
Designed to be used 'live' with Infoline. The tape commentary guides the user step-by-step through the programme referring to the manual for explanations and illustrations. Part 1 is intended for beginners and explains online systems and their operation together with instruction in the basic Infoline commands.